Preliminary considerations on the columns and framings of the Nicetas codex (Laur. Plut. 74.7)

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Abstract: The Nicetas codex (Laur. Plut. 74.7) dated 10th century is the oldest extant Greek manuscript on Hippocrates and his followers with commentaries of orthopaedic methods on fractures, luxations, subluxations, and bandaging techniques. Of visual interest are two texts, Apollonius of Citium on methods of joint treatment techniques, and Soranus of Ephesus on bandaging. The Apollonius of Citium text contains 29 color illustrations of Hippocrates techniques of reducing luxations of the joints, framed with semicircular pediments, two columns and arches. These frames are similar to the columns and arches seen in the Eusebian Gospel tables. The authors discuss the meaning of these frames as they apply to the Eusebian Gospels, and their importance as mnemonic devices for the Apollonius of Citium illustrations.
Keywords: Greek Manuscripts; History of Medicine; Scientific illustration; Frames; Ancient mnemotechny; Method of *Loci*; Learning strategies

ᴱˢ Consideraciones preliminares sobre las columnas y armazones del códice Nicetas (Laur. Plut. 74.7)

Resumen: El códice Nicetas (Laur. Plut. 74.7) del siglo X es el manuscrito griego más antiguo que se conserva sobre Hipócrates y sus seguidores con comentarios sobre métodos ortopédicos sobre fracturas, luxaciones, subluxaciones y técnicas de vendaje. De interés visual son dos textos, Apolonio de Citium sobre métodos de técnicas de tratamiento de articulaciones, y Sorano de Éfeso sobre vendajes. El texto de Apolonio de Citium contiene 29 ilustraciones en color de las técnicas de Hipócrates para reducir las luxaciones de las articulaciones, enmarcadas con frontones semicirculares, dos columnas y arcos. Estos marcos son similares a las columnas y arcos que se ven en las mesas del Evangelio de Eusebio. Los autores analizan el significado de estos marcos en su aplicación a los Evangelios de Eusebio y su importancia como recursos mnemotécnicos para las ilustraciones de Apolonio de Citium.
Palabras clave: Manuscritos griegos; Historia de la Medicina; ilustración científica; marcos; mnemotecnia antigua; método de *Loci*; estrategias de aprendizaje.

Contents: 1. Origins of the table frames. 2. The frames in the Nicetas codex.. The posterity of the framings in the Apollonius of Citium manuscripts. 4. The raison d'être of the framings in the Nicetas codex: some thoughts. 5. Conclusion. 6. References.- 6.1. Primary Sources. 6.2. Bibliography

A medical manuscript, exceptional in its antiquity, its careful presentation, its magnificent illustration, its history and its affiliation, is preserved in Florence's Biblioteca Laurenziana Medicea. It was purchased in Crete in 1492 by Janus Lascaris on behalf of Lorenzo de Medici and it became part of the Medici private library. The Laur. Plut. 74.7, also known as the Nicetas codex, was written in Constantinople, in Greek, early 10th century, and is thought to have been produced by the imperial scriptorium during the reign

of Constantine VII Porphyrogenitus (905-59).[1] It is a large quarto 368 x 277 mm (14.5 x 11 in.), which contains II+408+III parchment folios written in *minuscule bouletée*, a lowercase cursive form, in two columns.[2]

It is one of the few surviving Greek *codices vetustissimi* and it is the oldest or one of the oldest copies of some of the sixteen treatises it contains (some complete, others incomplete). Indeed, for some treatises, such as *Signs of Fractures* (*De signis fracturarum*) and *Bandages* (*De fasciis*) of Soranus of Ephesus, it is the one and only witness and, for still others, such as the treatise *On Joints* (*In Hippocratis de articulis commentarius*) by Apollonius of Citium or the treatise *On Fractures* (*Scholia in Hippocratis de fracturis*) of Palladius, it is the unique model of subsequent copies.[3] The various medical treatises date from the early work of Apollonius of Citium, 1st century BC, to Paulus Aegineta, 6th-7th century AD. Only two among these works are illustrated: Apollonius of Citium's *On Joints* (fols. 180v-225v) with 30 full page miniatures, and Soranos of Ephesus' *On Bandages* (fols. 228-240v) with 60 miniatures.[4]

This paper focuses on the miniatures of Apollonius of Citium's treatise and, more specifically, to their frames. Indeed, 29 out of 30 miniatures of Apollonius of Citium's *On Joints*, are framed with a semicircular pediment (two columns and an arch). In most manuscript illuminations, frames are used to set off the person or object within. Especially, when frames are composed by architectural elements such as columns and arches the importance of the individual or object is strongly emphasised. There are examples of its use to honour saints, religious events, emperors, calendars, astronomical charts, as well as more functional uses, for example, an early Greek mathematics student workbook (see *infra*, fig. 1 and n. 8), but, most of the time, with none of the elaborate decorations as seen in the Nicetas codex.[5] The

overarching aim of this paper is therefore to identify the raison d'être of the frames in the latter. Why use these framings for a medical manuscript? Did they merely have a symbolic and/or a decorative meaning? Or were they used as a utilitarian tool for helping readers of the Nicetas codex in their approach to the text?

1. Origins of the table frames

Referring to the addition of frames in Greek and Latin manuscripts, Kurt Weitzmann states that the desire of the miniaturist to increase the importance of the miniature expressed itself in various forms: "The illustrator started to draw a simple borderline around a miniature, with the result that now the beholder's eye no longer conceived text and illustration as homogenous, as in a papyrus roll, but tended to see a framed picture isolated from the text, as if it were on a different plane.[6]" While some papyri did utilize frames, these were introduced more frequently very soon after the generalisation of the codex, occurring already in the earliest existing codex fragments.[7] In the course of time miniaturists realized the artistic and layout possibilities of the borderlines and turned them into massive decorative frames.

The earliest surviving example of columns of text in architectural frames is a 3rd century BC papyrus roll from Egypt (Cairo, Egyptian Museum, no. 65445 [Trismegistos 59942 = LDAB 1054]) of Greek school exercises (fig. 1).[8]

The exercises are laid out in tables in decorated architectural frames, which increases the clarity of the layout by accentuating the divisions between the tables of the columns of text along the roll. The frames have vertical columnar bands, with simple bases and capitals. The tops of the frames are flat, without a pediment. Ornate frames with pedimental tops in a variety of shapes, sometimes with curtains, were used for portraits, such as Constantius II's on

1   For a reproduction: http://mss.bmlonline.it/Catalogo.aspx?Shelfmark=Plut.74.7; Massimo Bernabò (ed.), *La collezione di testi chirurgici di Niceta: Firenze, Biblioteca Medicea Laurenziana, Plut. 74,7. Tradizione medica classica a Bisanzio*. Rome: Edizioni di storia e letteratura, 2010.

2   David Speranzi, "Note codicologiche e paleografiche", in: Massimo Bernabò (ed.), *La collezione di testi chirurgici di Niceta: Firenze, Biblioteca medicea laurenziana, Plut. 74.7: tradizione medica classica a Bisanzio*, Roma: Edizioni di storia e letteratura, 2010, 13-35.

3   Marie-Hélène Marganne, "Le codex de Niketas et la médecine byzantine", in: Massimo Bernabò (ed.), *La collezione di testi chirurgici di Niceta, Firenze, Biblioteca Medicea Laurenziana, Plut. 74.7 tradizione medica classica a Bisanzio*, 2010, 47-53, p. 47.

4   For a full description of these miniatures, see Francesca Marchetti, "Le illustrazioni dei testi *Sulle articolazioni* (περὶ ἄρθρων πραγματεία) di Apollonio di Cizio e *Sulle fasciature* (περὶ ἐπιδέσμων) di Sorano di Efeso", in: Massimo Bernabò (ed.), *La collezione di testi chirurgici di Niceta. Firenze, Biblioteca Medicea Laurenziana, Plut. 74.7. Tradizione medica classica a Bisanzio*, Roma: 2010, 55-90.

5   The miniatures with frames appear on folios 182r, 183v, 184v, 185v, 186v, 187v, 189r, 190r, 191v, 194v, 195v, 196v, 197r, 198v, 200r, 201r, 202v, 203v, 204v, 207r, 208r, 209r, 210r, 217r, 219r, 220v, 221v, 222v, and 223v. The majority of the miniatures have 4, while others have 5, 6, and 7 base steps. Some have the incorrect matching number of steps on the opposite column, and 5 miniatures are lacking curtains. The first three miniatures, ff. 182r, 183v and 184v have 7 base steps, with no

curtains on f. 184v. Folio 185v has 6 steps on the left side, 5 on the right. Folio 186v has 5 on the left, 6 on the right. Folio 187v has 6 steps. Folio 189r has 4, with no curtains. Folio 190r has 4, with the top base as a torus, rounded base. Folio 191v has 4, with no curtains. Folio 194v has 4, with no bands holding the curtains to the columns. Folio 194v has 5. Folio 196v has 5 with the top base being narrower than the columns above it. Folios 197r, 198v, and 200r have 4 steps. Folios 201v and 202v have 5 steps. Folio 203v has 4 steps. Folio 204v has 4 steps and has no curtains. Folios 207r and 208r have 4 steps. Folios 209r and 210r have 4 steps, and both have simplistic drawings of the capitals. Folio 217r has 4 steps and is missing the assistant on the left side of the miniature, the image of the assistant having likely been worn away. Folio 219r has 3 steps and has simplistic drawings of the capitals. Folio 220v has 4 steps, with simplistic drawings of the capitals, in comparison to other framings in the codex. Folio 221v has 4 steps, with simplistic drawings of the capitals. The treatment image overlaps the columns. Folio 222v has 4 steps with simplistic drawings of the capitals. Folio 223v has 4 steps.

6   Kurt Weitzmann, *Illustrations in Roll and Codex. A Study of the Origin and Method of Text Illustration*. Princeton, N.J.: 1970², p. 97.

7   Cf. e.g. Milan, Biblioteca Ambrosiana, F 205 inf. [Martini-Bassi 1019]), from the 5th C. For a reproduction: https://digitallibrary.unicatt.it/veneranda/0b02da8280051bb9.

8   On this papyrus, see Octave Guéraud and Pierre Jouguet, *Un livre d'écolier du IIIe siècle avant J.-C.* Le Caire: Imprimerie de l'Institut français d'archéologie orientale, 1938 (see also: https://papyri.info/dclp/59942; https://www.trismegistos.org/text/59942.
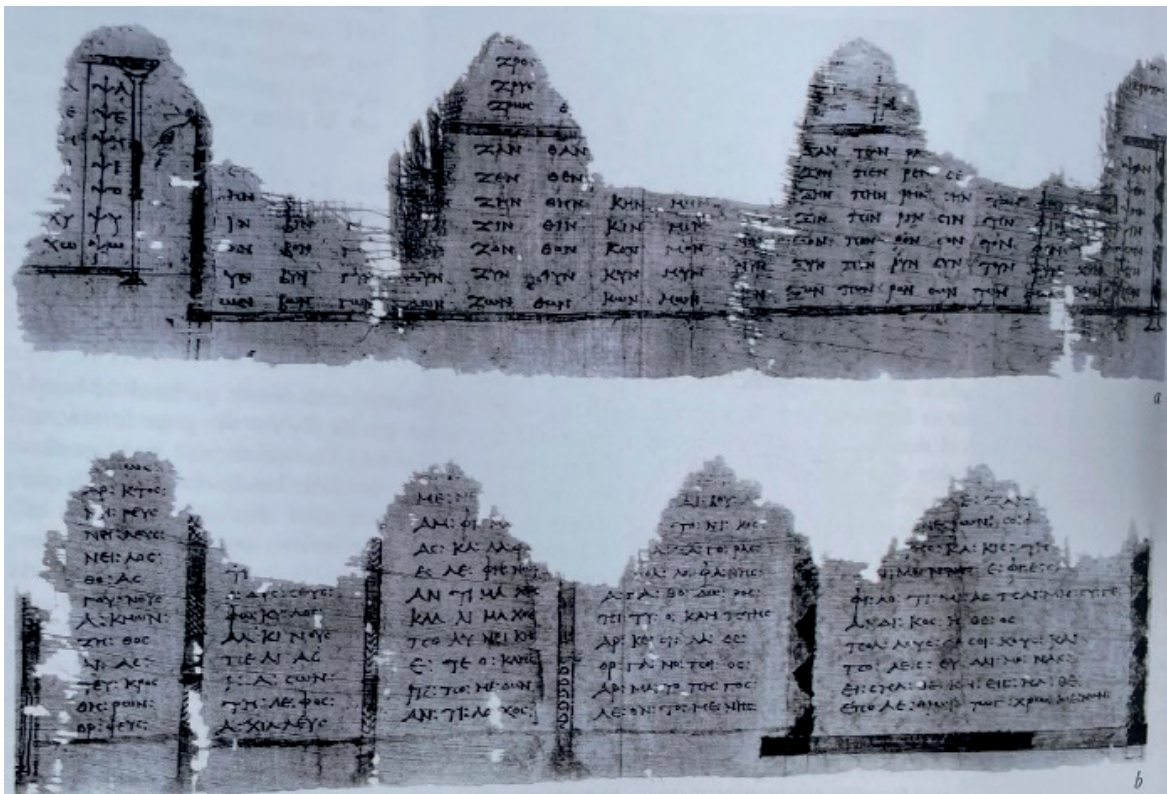
Fig. 1. Cairo, Egyptian Museum, no. 65445 [Trismegistos 59942 = LDAB 1054]

Figs. 2-3. Florence, Biblioteca Medicea Laurenziana, Plut. 74.7, f. 194v and 220v
(Courtesy of the MiC.Any further reproduction by any means is prohibited)

the Calendar of 354.[9] Other tables in codices were used for astronomical charts[10] and some simple arches were also used in a medical manuscript on cauterizations.[11] The Nicetas codex with 29 framed illustrations contains probably more column and arch framings than any other Greek manuscript (figs. 2-3). Its frames are typical of similar framings used in the Eusebian canon Gospel tables[12] and various scholars have acknowledged this similarity.[13]

More precisely, among the Gospel canon tables, the 29 framings of the Nicetas codex present very close similarities of style to the Etchmiadzin (fig. 4)[14]

Fig. 4. Yerevan, Matenadaran, MS. 2374, f. 1r

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[9] The calendar is preserved in seventeenth-century drawings (Vatican, BAV, Barb. Lat. 2154.) For a reproduction: https://digi.vatlib.it/view/MSS_Barb.lat.2154.pt.A & https://digi.vatlib.it/view/MSS_Barb.lat.2154.pt.B.

[10] Cf. e.g. Vatican, BAV, Vat. gr. 1291. For a reproduction: https://digi.vatlib.it/view/MSS_Vat.gr.1291. On this manuscript, see Matthew R. Crawford, *The Eusebian canon tables: ordering textual knowledge in late antiquity*. Oxford: Oxford University Press Oxford, 2019.

[11] Rome, Bibl. Casanatense, MS. 1382 (olim A.II.15). On this codex, see e.g. Loren MacKinney, *Medical illustrations in medieval manuscripts*. London: Wellcome Historical Medical Library, 1965, n° 45 and 63; Weitzmann, *Illustrations in Roll and Codex*, p. 103, pl. XXIX, fig. 89 (see also: https://wellcomecollection.org/works/hzhvz3ck; https://en.wikipedia.org/wiki/Roland_of_Parma).

[12] The canon tables were devised by Eusebius of Caesarea, Palestine (d. c. 340) to be a powerful concordance tool in order for the Gospels to be read in a more orderly fashion, by allowing the reader to connect the similar Gospel stories contained in the four Gospels of Mathew, Mark, Luke and John. The tables contain numbered lists of passages that are either shared in two or more Gospel accounts, or are unique to a particular Gospel, thus allowing one to read similar accounts of events told by the different evangelists. The architectural frames used to house the Canon tables consisted of two columns, each column sitting on a base, supporting an arch on top. The arch creates a semicircular panel beneath it, which is decorated with geometric patterns or flora and fauna. Judith Mckenzie and Francis Watson state that the design probably originally represented semi domes. This design of two columns and its covering arch is classified as a semicircular pediment (Judith S. McKenzie and Francis Watson, *The Garima Gospels: early illuminated Gospel books from Ethiopia*. Oxford: Manar al-Athar; University of Oxford, 2016, p. 87).

[13] Cf. e.g. Weitzmann, *Illustrations in Roll and Codex*, p. 108-109; Marganne, "Le codex de Niketas"; Irina Oretskaia, "Style and date of the miniatures of the Hippokrates collection manuscript", in: Massimo Bernabò (ed.), *La collezione di testi chirurgici di Niceta, Firenze, Biblioteca Medicea Laurenziana, Plut. 74.7 tradizione medica classica a Bisanzio*, 2010, 91-97; Marchetti, "Le illustrazioni dei testi *Sulle articolazioni*.

[14] Yerevan, Matenadaran, MS. 2374, formerly Etchmiadzin Ms. 229, 10th century. Sirarpie Der Nersessian and, five years later, Carl Nordenfalk considered the Eusebian canon tables of the Etchmiadzin Gospels to be the best representative of the original table design, developed in Caesarea Palestine at the time of Eusebius, 4th century (Sirarpie Der Nersessian, "*The Date of the Initial Miniatures of the Etchmiadzin Gospel*". *The Art Bulletin* 15,4 (1933): 327-360; Carl Adam Johan Nordenfalk, *Die Spätantiken Kanontafeln: Kunstgeschichtliche Studien über die Eusebianische Evangelien-Kondordanz in den vier ersten Jahrhunderten ihrer Geschichte*. Göteborg: Isacsons, 1938, p. 61, 70-72). On this codex, its date (and more nuanced hypotheses on the origins and influences of its miniatures), see also Dickran Kouymjian, "The Evolution of Armenian Gospel Illumination: The Formative Period (9th-11th Centuries)", in: Christoph Burchard (ed.), *Armenia and the Bible. Papers presented to the International symposium held at Heidelberg (July 16-19, 1990)*, Atlanta (Ga.): Scholars press, 1993, 125-142; N. G. Kotanjyan, "*The Etchmiadzin Gospel*". Հիմնարար հայագիտություն = *Fundamental Armenology* 1, 3 (2016): 329-393.

Fig. 5. [Tegrāy Province], Endā Abbā Garimā Monastery, MS I (Abba Garima I), f. 12r

and the Garima (fig. 5)[15] table framings. They consist of thick columns sitting on base steps, a set of Corinthian or Aksumite capitals, a decorative arch and two opened curtains that are attached on the inner sides of the columns. Other than the outer right and left acroteria on the arch, there is no other foliage, birds or animals decorating the arch. The outer band of the arch is decorated with a rhombus color pattern of pink, white and blue. Irina Oretskaia[16] describes it as iridescent small triangles and rhombuses, and states that ornament of this type was widespread in 10th-century manuscript illumination. Sirarpie Der Nersessian, in referring to this pattern in the Etchmiadzin Gospels, describes it as a rainbow motif, a succession of small lozenges of different colors, passing from light to dark, which gives the impression of being in high relief and resembling the arches which decorate the portals of churches.[17]

Specific similarities of the Nicetas codex to the Etchmiadzin tables include step bases, the Etchmiadzin having three thick marble columns with Corinthian capitals, and one image having a reddish rhomboid pattern in the arch. The Etchmiadzin has curtains on the four-columned tempietto, but none on the two-column framings. The Nicetas codex has also similarities to the Garima Gospel 1. Garima 1 is the earliest four-Gospel book with a complete set of decorated canon tables, based on Greek prototypes. Previously dated to between the eighth and the thirteenth centuries, its parchment is now dated to 530-660 CE, based on a single carbon 14 reading.[18] The Garima 1 framings have the thick marble columns with capitals demonstrating an Aksumite style pattern. The curtains are attached to the inner side of the columns. Specific similarities of the Nicetas codex to the Garima Gospels include thick marble columns, with similar marbling patterns, curtains on the inner side of the columns, and one image having the rhomboid pattern in the arch.

2. The frames in the Nicetas codex

In his *Roll and Codex*, Weitzmann discusses that a way to convert a column miniature (from a scroll) to a full page in a codex is by filling the increased area with ornamental features, one of the most common devices being the application of a framing arch. According to him, this is used in the Apollonius of Citium miniatures. Indeed, referring to the Nicetas codex, Weitzmann points out that in the miniature showing the treatment of a dislocated/subluxated vertebra, while two assistants are stretching the patient with a windlass, and a physician applies pressure by sitting on the patient's back, we can observe that the two kneeling assistants overlap the columns, and do not fit the space within the arch (fig. 6). According to him, this demonstrates that picture and frame were not conceived together, and the framing columns and arch were added some time later (fig. 7).[19]
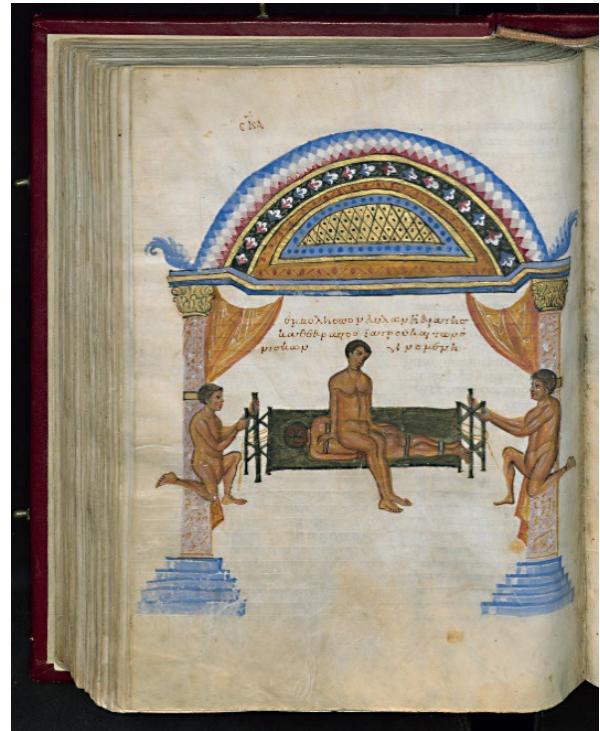

Fig. 6. Florence, Biblioteca Medicea Laurenziana, Plut. 74.7, f. 202v (Courtesy of the MiC. Any further reproduction by any means is prohibited)

Weitzmann's argument is that the figures were found extended in the scroll, but when the text was transferred to a codex it needed to be set off, the usual form of doing so being with the architectural frame. While there was space in the scroll for the miniature, it was too large for the framed example in the codex. Weitzmann proposes a roll image of what the original miniature could have looked like.[20] Apollonius lived in the first century BC and, as Weitzmann states, if Apollonius' writings were illustrated during or shortly after his lifetime,[21] they could have existed only in

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[15] The Garima Gospels are three ancient Ethiopic manuscripts kept in the Endā Abbā Garimā Monastery. They were written in Ge ' ez, an ancient Simitic Ethiopian language. All the three manuscripts contain four canonical Gospels with paratexts surrounding the biblical texts and also supplementary texts within the manuscripts of the Gospels (https://hmml. org/collections/repositories/ethiopia/end%C4%81-abb%C4%81-garim%C4%81-monastery/). Michael Gervers states that it is increasingly clear that the miniatures from the three Garima Gospel books belong to a very early history of Christian Ethiopia. Skeptical of native Ethiopian artistic skill, it has been argued that the miniatures were imported from abroad and added to the text centuries later after the latter were copied. In the absence of any direct evidence for such an interpretation, there is a much more straightforward and simpler conclusion, that the manuscripts were both copied and illustrated in Ethiopia, and possibly within the confines of the abbey of Enda Abba Garima, where they have remained ever since (McKenzie and Watson, *The Garima Gospels* [preface by M. Gervers], p. VII; on these manuscripts see also Sergey Kim, "*New Studies of the Structure and the Texts of Abba Garima Ethiopian Gospels*". *Afriques* 13 (2022): 2022).

[16] Oretskaia, "Style and date of the miniatures", 92.

[17] Der Nersessian, "*The Date of the Initial Miniatures*", 338.

[18] McKenzie and Watson, *The Garima Gospels*, 1.

[19] Weitzmann, *Illustrations in Roll and Codex*, 108.

[20] *Ibidem*, fig. F (p. 109).

[21] Apollonius mentions images and there is certainty that he conceived his text with figures, images. It should be pointed out here that the ways in which figures are referred to differ from one author to another, and even from one work by the same author to another. In *De rebus bellicis*, for example, the first two figures are announced separately, while the other ten are announced as a whole. In contrast, Athenaeus the Mechanic does not mention any figures in the course of the text and therefore makes no reference, but in the epilogue he indicates that all the figures of the machines will be drawn and that what is obscure to the reader will become clear. Finally, it

the form of rolls, whereas the addition of the columns and arch presupposes the transformation from roll into codex.[22]

ΜΕΤΑ ΔΕ ΤΑ ΠΡΟΧΕΜΕΝΑ ΟΥΤWC ΕΠΙΛΕΓΕΙ ΚΑΙ
ΑCΙΝΕCΤΑΤΗ ΜΕΝ ΑΥΤΗ Η ΑΝΑΓΚΗ ΔCΙΝ ΗCΔΕ
ΚΑΙ ΚΑΘΕΖΕCΘΑΙ ΤΙΝΑ ΕΠΙ ΤΟ ΚΥΦWΜΑ ΑΥΤΟΥ
ΑΜΑ ΚΑΤΑΤΕΙΝΟΜΕΝΟΥ ΚΑΙ ΕΠΕΝCΕICΑΙ ΜΕΤ
ΕWΡΙCΘΕΝΤΑ WCΤΕ ΤΗC ΑΥΤΗC ΚΑΤΑ ΤΑCΕWC
Η ΚΑΙ ΤΗC ΔΙΟΝΙCΚWΝ ΓΙΝΟΜΕΝΗC ΑΝΤΙ ΤΟΥ
ΤΑΙC ΧΕΡCΙ ΠΙΕΖΕΙΝ ΔΙΑ ΤΗC ΚΑΘΕΔΡΑC ΕΠΕ
ΡΕΙΔΟΝΤΑC Η ΚΑΙ ΕΝCΕΙΟΝΤΑC ΑΝΑΓΚΑΖΕΙΝ
ΤΟ ΥΠΕΡΕΧΟΝ ΤWΝ CΦΟΝΔΥΛWΝ ΕΙC ΤΟ ΚΑΤΑ
ΦΥCΙΝ ΑΠΟΧWΡΕΙΝ ΟΝ ΤΡΟΠΟΝ ΔΕ ΔΕΙ ΤΟΝ ΚΑΤ
ΑΡΤΙCΜΟΝ ΠΟΙΕΙCΘΑΙ ΟΥΤWC ΥΠΟΤΕΤΑΚΤΑΙ

ΕΠΟΜΕΝWC ΔΕ ΤΑΥΤΑ ΚΑΤΑ ΚΕΧWΡΙΚΕΝ ΑΤΑΡ
ΚΑΙ ΕΠΙΒΗΝΑΙ ΤW ΠΟΔΙ ΚΑΙ ΟΧΗΘΗΝΑΙ ΤΟ CW
ΜΑ ΚΑΙ ΗCΥΧWC ΕΠΙCΕΙCΑΙ ΟΥΔΕΝ ΚWΛΥΕΙ
ΤΟΙΟΥΤΟΝ ΔΕ ΠΟΙΗCΑΙ ΜΕΤΡΙWC ΕΠΙΤΗΔΕΙΟC
ΑΝ ΤΙC ΕΙΗ ΤWΝ ΑΜΦΙ ΠΑΛΑΙCΤΡΗΝ ΕΙΘΙCΜΕ
ΝWΝ ΚΑΙ ΟΥΤΟC ΔΕΟ ΤΡΟΠΟC ΟΥΤWC ΑΝΕΠΙΤΕ

Fig. 7. Weitzmann's proposed image of what Apollonius of Citium could have appeared in roll form

Among many other scholars, Irina Oretskaia also states that one of the reasons for the introduction of framings in the Nicetas codex may be purely functional, with the change from a smaller format of the page in the archetype manuscript to a larger format of the new codex. She also believes that the framings of the Nicetas codex were likely added during the period of the Macedonian Renaissance (9th-11th centuries), more precisely of the period *ca* mid-tenth century, when the depiction of splendid classical architecture was revived.[23] She states that there were no architectural framings for the miniatures in the model of the Nicetas codex, and therefore suggests that these frames were made for the *Laurentianus*.[24]

Judith Mckenzie and Francis Watson, referring to the Apollonius of Citium framings, state that the miniaturists have misunderstood some of the architectural perspectives, such as the architrave.[25] Instead of a straight horizontal architrave/lintel, the Nicetas architrave/lintel appears to angle posteriorly on both sides, medial to the capitals. Although McKenzie and Watson suggest that this may be architecturally inaccurate, there is another interpretation to the design of the architrave shape. It appears to give depth to the arch, which may have been the miniaturist's intention, in order to create the impression of a semidome, rather than a flat semicircular pattern.[26] Indeed, McKenzie and Watson state that the canon table headpieces probably originally represented semidomes and gives an example in the Georgian Bert'ay Gospels[27] where a semidome, rather than a flat semicircular pattern is depicted on two canon table frames, their reasoning being, the line along the bottom of the semicircular panel is not straight, but is curved to convey the perspective of a semidome.[28]

The Nicetas codex frame miniatures appear to be the only ones that used the angling of the architrave. All of the 29 miniatures contain this detail, and it would likely have been easier for the miniaturists to simply use a straight line for the architrave/lintel, as is seen for example in canon table frames. However, the miniaturists chose not to. This angling can be seen on a second half of the 7th-century Byzantine mosaic images in the Basilica of Sant'Apollinare in Classe in Ravenna (fig. 8).[29] The image depicts Abel's and Melchizedek's sacrifice to Abraham, and the other depicts Emperor Constantine IV handing on to Bishop Reparatus (envoy of the Ravenna's archbishop) the privileges for Ravenna church.[30] The image has the columns and the arch, with curtains[31] hanging and attached

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should be noted that Heron of Alexandria, in the *Belopoiica* or the *Cheiroballistra*, uses references such as: such and such a part must be constructed as shown in such and such a drawing, whereas in the *Pneumatica* he makes no explicit reference to figures, but continually uses references with letters, rather like Aristotle in *Meteorology*. On ancient and medieval authors who used images, see Stavros Lazaris, "Donner à voir les savoirs scientifiques dans les mondes byzantin et latin (IVe-XIIe siècles)", in: *La conoscenza scientifica nell'alto medioevo. Atti delle LXVII Settimana di studio (Spoleto, 25 aprile - 1 maggio 2019)*, Spoleto: 2020, 1087-1128, Annex 1.

22 Weitzmann, *Illustrations in Roll and Codex*, 108 (on this point, see also Marchetti, "Le illustrazioni dei testi *Sulle articolazioni*, 58). According to Stavros Lazaris, the illustrations were the most of the time not painted in the roll, as Kurt Weitzmann proposes, but that they were painted, or drawn on separate boards or plates (πίνακες), which were then used for study. This is based on how texts were displayed and read during Antiquity. Because the texts were written in *scriptio continua,* reading aloud was the most common practice in Antiquity. If an image is added inside a text written in *scriptio continua,* the reading would be much more difficult (and also the understanding). See Stavros Lazaris, "*L'image paradigmatique: des Schémas anatomiques d'Aristote au De materia medica de Dioscoride*". *Pallas* 93 (2013): 129-162.

23 Oretskaia, "Style and date of the miniatures, 92.
24 *Ibidem*, 92.
25 McKenzie and Watson, *The Garima Gospels*, 83.
26 On this point, see also Oretskaia, "Style and date of the miniatures, 92.
27 Cambridge, MA, Harvard University, Houghton Library, MS Georgian 1, f. 4v.
28 McKenzie and Watson, *The Garima Gospels*, 87.
29 For a color reproduction, see: https://fr.wikipedia.org/wiki/Fichier:Sacrifices_of_Abel,_Melchisedec_and_Abraham_-_Sant%27Apollinare_in_Classe_-_Ravenna_2016_(2).jpg. See also Friedrich Wilhelm Deichmann, *Ravenna: Hauptstadt des spätantiken Abendlandes*. Wiesbaden: F. Steiner, 1969.
30 On this mosaic, see Erich Dinkler, *Das Apsismosaik von S. Apollinare in Classe, von Erich Dinkler*. Köln, Opladen: Westdeutscher Verlag, 1964, pl. XVII. On Reparatus, see also Klaus-Peter Johne and Silvia Letsch-Brunner, "Reparatus", in: Hubert Cancik and Helmuth Schneider (ed.), *Brill's New Pauly*, Leiden; Boston (Mass.): Brill, 2006, 500
31 Curtains were a common feature of monumental architecture and frequently appear in manuscript miniatures thereof. The curtains which are pulled to the insides of the columns and fastened to them with either plain or jewel-studded metal bands, are similar to the canon tables of eastern Gospel books, like the Greek one in Baltimore, Walters Art Museum, W 532 (Weitzmann, *Illustrations in Roll and Codex*, 108-109. On this codex, see also Georgi R. Parpulov, *Middle-Byzantine*

on the inner sides of the columns, as is seen in the Nicetas codex. The angling of the architrave was used before the Nicetas codex at least in this Byzantine mosaic.[32]

Fig. 8. Ravenna, Basilica of Sant'Apollinare in Classe

3. The posterity of the framings in the Apollonius of Citium manuscripts

In 1492, the Nicetas codex was kept in Heraklion (Crete), where it was purchased by Janus Lascaris on behalf of Lorenzo de' Medici, known as the Lorenzo the Magnificent. His son Peter de' Medici inherited the manuscript, of which Lascaris commissioned a superb corrected copy (Paris, BnF, gr. 2248).[33] This manuscript consists of two distinct parts. The first is a copy of the Nicetas codex executed under the direction of Lascaris. The second part consists of drawings for the repositioning of dislocations and of surgical instruments roughly made with a pen, which are almost always on one side of the folio. These very amateurish drawings derived from the Laur. Plut. 74.7. It appears that there was no original intention to illustrate the first part, as there are no illustrations in the text as in the Nicetas Codex.[34]

Pope Clement VII (born Giulio de' Medici) had the gr. 2248 transferred to Rome in 1534. It then entered the collection of Cardinal Ridolfi,[35] grandson

of Lorenzo de' Medici, who commissioned Mathew Devaris and Guido Guidi (Vidus Vidius) to make a transcription of the Lascaris copy and to translate it into Latin. The result was two magnificent manuscripts: Paris, BnF, gr. 2247 (fig. 9)[36] and Paris, BnF, lat. 6866,[37] copied by Christopher Auer. A Greek epigram attributes the drawings of the gr. 2247 to Joannes Santorinos of Rhodes. The lat. 6866 was illustrated by Francesco de' Rossi, known as Salviati, and his pupils, and perhaps in part by Francesco Primaticcio.[38]

In the mid-1500s, many scholars translated Galen's anatomical treatises into Latin. Giovanni Bernardo Feliciano[39] translated some of Galen's commentaries on Hippocrates in an edition first printed in 1541[40], which contains no figures. However, the second edition, published in 1550, included illustrations, but without frames (*Galeni in librum Hippocratis qui, quae in medicatrina fiunt, inscribitur. Commentariorum libri tres*, pp. 197-223; *Galeni in librum Hippocratis de Fracturis commentariorum libri très*, pp. 223-250; *Galeni in librum Hippocratis de articulis commentariorum libre quatuor*, pp. 251-293).[41]

Another translator of Greek medical texts, Guido Guidi (Vidus Vidius), used figures, but without frames, both for the translation published in 1544 (*Galeni in Hippocratem de fracturis commentarius secundus*, pp. 155-214; *Galeni in Hippocratem de articulis commentarius primus*, pp. 215-341; *Galenus de Fasciis,*

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evangelist portraits a corpus of miniature paintings. 2023, n° 201, p. 28-29).

[32] There appears to be no other examples of this angling of the architrave in any other images of the preserved canon table framings.

[33] https://archivesetmanuscrits.bnf.fr/ark:/12148/cc22366t. On this codex, see e.g. Marchetti, "Le illustrazioni dei testi *Sulle articolazioni*, 85-87.

[34] On this point, see C. E. Kellett, "*The School of Salviati and the illustrations to the Chirurgia of Vidus Vidius, 1544*". *Medical History* 2, 4 (1958): 264-268, p. 266.

[35] See e.g. Mirko Dražen Grmek, "Vidius et les illustrations anatomiques et chirurgicales de la Renaissance", in:

August Buck (ed.), *Sciences de la Renaissance. VIIIᵉ congrès international de Tours*, Paris: J. Vrin, 1973, 175-186; Vivian Nutton, "Humanist Surgery", in: A. Wear, R. K. French and I. M. Lonie (ed.), *The medical renaissance of the sixteenth century*, Cambridge: Cambridge University Press, 2009, 75-99; Stefania Fortuna, "Le illustrazioni nei testi medici: le edizioni latine di Galeno del XVI-XVII sec.", in: Vanna Maraglino (ed.), *Scienza antica in età moderna: teoria e immagini*, Bari: Cacucci Editore, 2012, 311-337.

[36] https://archivesetmanuscrits.bnf.fr/ark:/12148/cc22365k.

[37] https://archivesetmanuscrits.bnf.fr/ark:/12148/cc660167.

[38] On these two manuscripts, see e.g. Henri Omont, *Collection de chirurgiens grecs, avec dessins attribués au Primatice. Reproduction réduite des 200 dessins du ms. latin 6866 de la Bibliothèque nationale*. Paris: Berthaud, 1908; Marchetti, "Le illustrazioni dei testi *Sulle articolazioni*, 87-89; Maxence Hermant, *Trésors royaux. La bibliothèque de François Iᵉʳ. Exposition, Blois, 4 juillet-18 octobre 2015]*, Château royal de Blois [avec la collaboration de la Bibliothèque nationale de France. Blois; Rennes: Château royal de Blois; Presses universitaires de Rennes, 2015, p. 231, 305 (gr. 2247); p. 231, 305 (lat. 6866).

[39] On Feliciano, see Fortuna, "Le illustrazioni nei testi medici", 311-337; Stefania Fortuna, "*The Latin Editions of Galen's Opera omnia (1490–1625) and Their Prefaces*". *Early Science and Medicine* 17 (2012): 391-412; Antoine Pietrobelli, "*Deux traducteurs humanistes de Galien: Giovanni Bernardo Regazzola Feliciano et Jean Vassès*". *Galenos* 11 (2017): 209-226; Gary Bovine, "*From the Greek Exarthrema, Pararthrema, to the Latin Luxatio, Subluxatio: Origins and Early Definitions of the Word 'Subluxation'*". *Chiropractic History* 38, 1 (2018): 12-19.

[40] Galenus, *Galeni Septima classis, artem morborum curatricem describit: promptaque ad id opus remedia quem plurima subjungit, necnon quae ad deligationes, luxationes, & fracturas attinet, chirurgiam...* Venetiis: apud haeredes Lucaeantonii Juntaeapud haeredes Lucaeantonii Juntae, 1541.

[41] Galenus, *Galeni septima Classis curandi Methodum tum diffuse tum breviter descriptam, Victus Rationem in Morbis acutis, singulorum Morborum facile paranda Remedia, privatam quorundam Morborum Curationem, Chrirurgiae Constitutionem, Fracturarum ac Luxationum Sanationem, Fasciarum denique & Laqueorum & Machinamentorum Tractatum continet*. Venetiis: apud Juntas, 1550.

pp. 415-466) and Oribasius (*Oribasius delaqueis ex Heracle*, pp. 467-476; *Oribasius ex heliodoro de machinamentis*, pp. 477-534)[42] and for the one published in 1550 (*Galenus de Fasciis*, pp. 293-306; *Oribasius delaqueis ex Heracle*, pp. 467-476; *Oribasius ex Heliodoro de machinamentis*, pp. 477-534).[43] Several of these figures are influenced by the miniatures of the Nicetas codex. Indeed, and as pointed out by Jacqueline Vons, "Les dessins reprennent les illustrations du manuscrit de Nicétas et témoignent de la permanence des gestes chirurgicaux et orthopédiques de l'antiquité au XVIe siècle (et même plus tard): on les retrouvera dans les ouvrages de chirurgiens tels Ambroise Paré ou Jacques Dalechamps."[44]

Fig. 9. Paris, Bibliothèque nationale de France, grec 2247, f. 199r

In fact, other scholars included figures in their translations, which were also influenced by Nicetas' miniatures.[45] The copies made after the codex that reached Europe demonstrate that the styles of the miniatures changed with the culture of the time. The nude characters of doctors, patients and assistants changed to a European or Roman look, dressed. The arches and the columns were discarded from the miniatures. The situation was quite different in a Greek manuscript copied in the mid 1400.

Fig. 10. Bologna, Biblioteca Universitaria, gr. 3632, f. 427r (by permission of the Alma Mater Studiorum University of Bologna - University Library of Bologna)

Some decades before Giovanni Bernardo Feliciano and Guido Guidi's books, some of the medical miniatures of Apollonius of Citium's *On Joints* were copied by a scholar named John of Aron[46], using the similar but not identical columns and arch framings, and opinion is that it may have been copied from a manuscript similar to the Nicetas codex, but not the actual Nicetas codex. More precisely, in 1435-1453 John of Aron wrote a manuscript, Bologna, Biblioteca Universitaria, gr. 3632 with copies of 27 treatment

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42 Guido Guidi, *Chirurgia è graeco in latinum conversa, Vido Vidio Florentino interprete, cum nonnullis ejusdem Vidii co[m]mentariis*. Paris: Excudebat Petrus Galterius Lutetiae Parisiorum, M. D. XLIIII, 1544. In Guido Guidi book the miniaturist used the columns in a practical functional sense, where a beam is placed and tied horizontally to each column and used to assist the treatment of a dislocated shoulder. On these miniatures, see e.g. Grmek, "Vidius et les illustrations anatomiques", 175-186.

43 Galenus, *Galeni septima Classis curandi Methodum tum diffuse tum breviter descriptam, Victus Rationem in Morbis acutis, singulorum Morborum facile paranda Remedia, privatam quorundarum Morborum Curationem, Chrirurgiae Constitutionem, Fracturarum ac Luxationum Sanationem, Fasciarum denique & Laqueorum & Machinamentorum Tractatum continet*. Venetiis: apud Juntas, 1550.

44 Jacqueline Vons, "*Les ouvrages de Guido Guidi, premier lecteur royal de chirurgie de François Ier*". 28 (2016): 123-139, p. 130.

45 See e.g. François Le Fèvre de Bourges, *Les anciens et renommés aucteurs de la médicine et chirurgie. Hippocrates: Des ulceres, des fistules, des playes de la teste, avec les commentaires de Guy Vide sur chascun livre; Hippocrates: des fractures, des articles, de l'officine du chirurgien, avec les commentaires de Galien. Galien: des bandes. Oribase: des lacqs, des machines et engins. Le tout traduit fidèlement du grec et du latin en françoys par un docteur en medicine, et illustré de figures, par lesquelles la chose est au vif representee. Aveq une table tres-ample de toutes les matieres principales*. A Lyon, par Guillaume Rouille, a l'escu de Venise, 1555, avec privilege du roy.: 1555 who also discarded the columns and arch framings.

46 Stavros Lazaris, "*Rôles et natures de l'image scientifique à Byzance: étude préliminaire à travers trois érudits éponymes*". *Les Cahiers de Saint-Michel de Cuxa* 54 (2023): 45-61, p. 53.

miniatures as seen in the Nicetas codex (fig. 10).[47] A possession mark in the Bologna codex suggests that it was the personal property of John of Aron, said to be a doctor. The manuscript measures 293x220 mm. (115.3x86.6 in.), slightly smaller than the Nicetas codex. It is highly probable that physician John of Aron found the texts and images that make up the manuscript, but there is no certainty as to who produced the images. Perhaps it was a miniaturist with whom John of Aron worked. However, there is nothing to rule out the possibility that the miniaturist was John of Aron himself. The drawings appear simplistic, with various mistakes and inaccuracies noted. Some examples of mistakes are (1) the miniature of the attendants pressing down on a board to produce pressure on the back, where the attendant on the right side of the miniature is drawn too far from the board, so the miniaturist simply attached more length to the board so that it could reach the attendant, (2) the treatment of manual reduction for the hip joint, where the Nicetas codex has the patient in the supine position, while the Bologna codex has him in the prone position, (3) the traction treatment of the hip, in the Nicetas codex the patient is supine, while in the Bologna codex the patient is prone.

The Bologna codex also contains some inaccuracies in the base steps, much like the base steps in the Nicetas miniatures, some having 7, 5, and 4 and some having differences in numbers of base steps when comparing right and left columns (see *supra* n. 5). Each miniature has a caption, consistent with those in the Nicetas codex. While the positions of the treating assistants, patient and doctor appear similar to the Nicetas codex, the arches and the columns have totally different decorative patterns. The Bologna images have circular and geometric patterns on the arches and the columns, while the Nicetas codex columns have various marble patterns. The architrave is a straight line similar to the Gospel canon table frames (see *supra*) and does not have the angling of the architrave as seen in the Nicetas codex miniatures. Franchesca Marchetti states that the differences between the miniatures in Bologna 3632 and those in the Nicetas codex suggests that John probably did not copy his drawings from the Nicetas codex, and that John of Aron's source was possibly a copy now lost.[48]

4. The raison d'être of the framings in the Nicetas codex: some thoughts

After looking briefly at the different points of view of modern scholars on the similarities between the framings of the Canon table and the Nicetas codex, as well as the ideas regarding the addition of frames in the latter and their posterity, in the next few pages we will outline some opinions on their raison d'être.

John Beckwith suggested that the framings "derived originally from the desire to have a monumental framework" to house the tables.[49] This is similar to Kurt Weitzmann's explanation of having an elaborate decorative frame to house the contents of miniatures or writings.[50] As discussed by several scholars, and more recently by Susanne Wittekind the arches and aediculae are common architectural expressions of honour and dignity, common in antiquity in the depiction of rulers, officials and authors. In regard to the Eusebian canon tables, she states that as architectural signifiers of dignity, they were used for the canon tables to give a suitably dignified visual presence from a very early date, if not indeed from the very inception of the concept.[51] A few decades earlier, Carl Nordenfalk[52] hypothesized that the use of architectural frames to enclose and thus decorate the numeric grids was a compensation phenomenon. More precisely, the scientific numeric concordance of the canon tables lacked solemnity, and Nordenfalk felt that the architectural frames counterbalanced this by adding magnificent external splendor to the pages. The architectural frames increased the gravitas of what would otherwise be a simple numeric grid.

In his paper, Rolf Strøm-Olsen, after discussing Nordenfalk's views on this subject, argues that the intention behind the design was to emphasize that the canon tables served as a gateway to the Gospels. More precisely, he states that the tables with their architectonic setting acted as a kind of monumental gateway to the Gospel text, and this to him is clear because the illuminated tradition surrounding the tables became integrated and conventionalized through scribal copying across the centuries.[53] According to him, they also served as a symbolic reference to the idea of passage through the physical church.[54] The canon tables were not merely decorative, but bear symbolic significance.

Matthew Crawford also concludes that the ornamentation is not merely decorative but bears symbolic significance. Viewing the decorated pages of a set of canon tables was intended as a defined progression through an imagined architectural space leading to some sort of culmination at the end.[55] Judith McKenzie and Francis Watson disagree that the columns and arches represent the front of a building. They are of the opinion that, while at first glance, a canon table frame with a semicircular headpiece brings to mind the front of a free-standing building with a semicircular pediment supported by columns,

[47] On John of Aron, see ibid., p. 52-53.

[48] Francesca Marchetti, "Illustrated medical manuscripts in late Palaiologan Constantinople anf their fortune in Sixteenth-Century Italy", in: Angeliki Lymberopoulou (ed.), *Cross-cultural interaction between Byzantium and the West, 1204-1669: whose Mediterranean is it anyway?,* London; New York, N.Y., N.Y.: Routledge, 2018, 318-341, p. 328.

[49] John Beckwith, *Early Christian and Byzantine art.* Harmondsworth: Penguin Books, 1979², p. 42 (quoted from: Rolf Strøm-Olsen, "*The Prophylaic Function of the Eusebian Canon Tables in Late Antiquity*". *Journal of Early Christian Studies* 26,3 (2018): 403-431, p. 412).

[50] Weitzmann, *Illustrations in Roll and Codex,* 97.

[51] Susanne Wittekind, "Shifting Frames: The Mutable Iconography of Canon Tables", in: Alessandro Bausi, Bruno Reudenbach and Hanna Wimmer (ed.), *Canones: the art of harmony the canon tables of the four Gospels,* Berlin: De Gruyter, 2020, 209-250, p. 209.

[52] Nordenfalk, *Die Spätantiken Kanontafeln,* 125 On the canon tables, see also Martin Wallraff, *Die Kanontafeln des Euseb von Kaisareia: Untersuchung und kritische Edition.* Berlin: De Gruyter Berlin, 2021.

[53] Strøm-Olsen, "*The Prophylaic Function*", 404.

[54] Ibid., p. 404-405. On this point, see also Rouzanna Amirkhanian, "*Les tables de canons arméniennes et le thème iconographique de la Jérusalem céleste*". *Revue des Etudes Armeniennes* 31 (2008-2009): 181-232, p. 183.

[55] Crawford, *The Eusebian canon tables,* 248.

pediments formed with a full semicircle were not used as the main pediment at the front of a building because they would have been too heavy. That the canon tables are not alluding to a free-standing building with a semicircular pediment is also suggested by the fact that they do not have an entablature depicted across the base of the headpiece, but only a simple lintel.[56] McKenzie and Watson also address this view again when discussing the architrave of the Nicetas codex illustrations.[57]

Judith McKenzie however, as an architectural historian, is viewing this with the eyes of actual building architecture. One could question whether the miniaturists of the canon tables and the Nicetas codex would know the technical details of building architecture, so they may not have been aware of detailed building requirements needed to support such structures; they drew the columns and the arches as painters, not with technical architectural emphasis in mind. Indeed, an image often refers to a reality without representing it mimetically. An image is not always a perfect imitation of its model: anything that it does not show, or that it does not show exactly, can be reconstituted by the imagination (the *phantasia*) of the viewer/reader, provided that the viewer/reader is familiar with the object represented.[58]

With regard to the miniatures in the Nicetas codex, if we consider the context in which this abridged and illustrated version of the Hippocratic treatise on joints (*De articulis*, περὶ ἄρθρων) was conceived[59] and the fact that it was used in the training of doctors[60] (probably at the Hospital of the Forty Martyrs[61]), we can assume that they were used as a mnemonic visual device. The future Byzantine doctors used the miniatures of this codex to memorise the symptoms and the treatments for each case[62].

Indeed, the picture can play the role of a mnemonic device.[63] Modern neuroscience researchers[64] have put forward two hypotheses about the superiority of figurative images over words as memory aids. According to the first hypothesis, that of dual-coding theory,[65] the figurative image is superior to the written word, because we spontaneously verbalise a drawing by naming the object it represents (when we see a horse, we mentally name it with the word "horse"). So, when a drawing is presented, it is coded both pictorially and verbally: this is known as dual-coding theory. In contrast, a word is not always encoded as an image. So, dual-coding helps to store more information in the memory and improves recall. According to the second hypothesis, the figurative image plays the role of mediator. The image serves to bind together the information we need to memorise. Research in this area has shown that images are also effective thanks to the mechanism of integration coding (or image mediation).[66]

These two very specific characteristics of images give credence to what the ancients Greeks and Latins said about the predominance of images over other media as a memory aid. It is still accepted today that each sense has its own memory, but that the main sensory memories in humans are auditory and visual. According to some ancient scholars, vision even took precedence over hearing. The best-known text on the superiority of vision is probably an extract from Horace's *Epistle to the Pisones* (*Ars Poetica*). In this poem, Horace affirms the superior efficacy of vision compared with oral communication.[67] According to

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[56] McKenzie and Watson, *The Garima Gospels*, 85.

[57] *Ibidem*, p. 83.

[58] On this point, see e.g. Lazaris, "Donner à voir les savoirs scientifiques", 1087-1128; Stavros Lazaris, "*Principles of differentiation and identity in Greek scientific manuscripts*". *Archives Internationales des Sciences* ([in print]).

[59] Apollonius of Citium adapted this treatise by adapting the original (Hippocratic) text to the images added in a strictly didactic purpose.

[60] As noted by Edouard Jeanselme, this manuscript, which summarised all medical and surgical knowledge, can be consulted "par les médecins de l'hôpital, mais aussi par ceux qui étaient chargés d'instruire les étudiants dans l'école annexée à l'établissement" (Edouard Jeanselme, "Sur un aide-mémoire de thérapeutique byzantin contenu dans un manuscrit de la Bibliothèque Nationale de Paris (Supplément Grec 764). Traduction, notes et commentaires", in: *Mélanges Charles Diehl*, Paris: E. Leroux, 1930, 147-170, p. 169). This idea is also shared by Timothy S. Miller, who does not hesitate to argue that the reading of the epigrams found on the f. 7ᵛ of the *Plut.* 74, 7 "emphasize that the codex and its pictures served as a valuable reference tool for both young and more experienced physicians as well as for the *hypourgoi* [medical assistants] authorized to use the knife. Finally, they praise the manuscript as an excellent teaching aid [...]" (Timothy S. Miller, *The Birth of the hospital in the Byzantine Empire*. Baltimore, Md.; London: The Johns Hopkins university press, 1997, p. 181). See also Stavros Lazaris, "Scientific, Medical and Technical Manuscripts", in: Vasiliki Tsamakda (ed.), *A Companion to Byzantine illustrated manuscripts*, Leiden: Brill, 2017, 55-113 & figs. 113, 118-138, p. 87-88.

[61] According to a written note in fol. 407r by a 14th-century scribe, this codex belonged at that time to a hospital (τοῦ νοσοκομείου τῶν). Antonio Cocchi (A. Cocchi, *Graecorum chirurgici libri Sorani unus de fracturarum signis: Oribasii duo de fractis et de luxatis e collectione Nicetae ab antiquissimo et optimo codice Florentino [...]*. Florentiae: Ex Typographio imperiali, 1754, p. 42) believed that this hospital was that of the Forty Martyrs located in Constantinople. This hypothesis,

[continued next column]

although plausible, cannot be proven (see Lazaris, "*Rôles et natures de l'image scientifique à Byzance*", 53-54).

[62] On scientific teaching in Byzantium, see Immaculada Pérez Martín and Divna Manolova, "Science Teaching", in: Stavros Lazaris (ed.), *A Companion to Byzantine Science (4th-15th C.)*, Leiden: Brill, 2020, 53-104.

[63] On the mnemonic qualities of scientific illustrations, see e.g. Stavros Lazaris, *Art et science vétérinaire à Byzance. Formes et fonctions de l'image hippiatrique*. Turnhout: Brepols, 2010.

[64] See e.g. Raymond Ducharme and Paul Fraise, "*Étude génétique de la mémorisation de mots et d'images*". *Canadian Journal of Psychology* 19 (1965): 253-261; Allan Paivio, "*Abstractness, imagery, and meaningfulness in paired-associate learning*". *Journal of Verbal Learning and Verbal Behavior* 4 (1965): 32-38; Allan Paivio, "*Mental imagery in associative learning and memory*". *Psychological Review* 76 (1969): 241-263; Gordon Wood, "*Mnemonic systems in recall*". *Journal of Educational Psychology Monographs* 58,6, suppl. 2 (1967): 1-27; Michel Denis, *Les images mentales*. Paris: Presses universitaires de France, 1979.

[65] On dual-coding, see e.g. Allan Paivio, *Mental Representations: A Dual Coding Approach*. New York, N.Y.: Oxford University Press, 1990. See also: Michel Denis, *Représentation imagée et activité de mémorisation*. Paris: Éditions du Centre national de la recherche scientifique, 1975; Liliane Vezin, "*Sémiologie et fonctions de l'illustration*". *Bulletin de psychologie* (1989): 796-807 and https://en.wikipedia.org/wiki/Dual-coding_theory.

[66] On this aspect of the image, see e.g. Gordon H. Bower, "*Imagery as a relational organizer in associative learning*". *Journal of Verbal Learning and Verbal Behavior* 9 (1970): 529-533.

[67] "Either an event is acted on the stage, or the action is narrated. Less vividly is the mind stirred by what finds entrance through the ears than by what is brought before the trusty eyes, and what the spectator can see for himself. Yet you will not bring upon the stage what should be performed behind the scenes,

Saint Thomas Aquinas also, most people remember what they see better than what they hear, and images offer a mnemonic advantage. They remind viewers of the holy story, which they must have known, if not through reading, then at least through teachings and sermons.[68] Four centuries earlier, in the Byzantine world, Photios (Patriarch of Constantinople from 858 to 867 and from 877 to 886), in the homily he delivered on 29 March 867 in the Church of Saint Sophia in Constantinople to celebrate the inauguration of the apse mosaic depicting the Virgin and Child, also recognised the superiority of sight over hearing.[69]

Even if we must tone down the impact of these words given the circumstances in which he delivered his sermon[70], it is clear that for Photios memory is most effective when it works through vision. This is not a eulogy extolling the superiority of images in their didactic functions (aiding comprehension), but in their quality as visual memory aids.[71]

After these brief explanations, it is clear that the miniatures in the Apollonius text have the inherent ability to summarise ideas as organised and structured visual items. Indeed, the image could play the role of a visual "epilogue" by gathering what has just been read by the pupil (or explained by the master), to paraphrase the words of Hugh of Saint Victor. The latter, in his *Didascalicon*, makes a distinction between learning and memorization. If the first step consists in the division of information in order to better explain it (as the division tables used at the Academy by Plato), the second step follows the opposite way by collecting the data; "it is what the Ancients called *epilogue*", i.e., a 'short recapitulation of what has just been said'", as the wise philosopher concluded.[72]

Pictures could also be used as "mental bookmarks"[73]. These rememorative figures would thus enable to easily find the relevant part of the text, even by browsing the manuscript. They were used hence as a tag (or as visual checklists), helping the reader to "navigate" the content of the book. When the reader is seeking a certain element in the midst of a mass of information, the image functions as

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and you will keep much from our eyes, which an actor's ready tongue will narrate anon in our presence; so that Medea is not to butcher her boys before the people, nor impious Atreus cook human flesh upon the stage, nor Procne be turned into a bird, Cadmus into a snake. Whatever you thus show me, I discredit and abhor." (*Aut agitur res in scaenis aut acta refertur. Segnius inritant animos demissa per aurem quam quae sunt oculis subiecta fidelibus et quae ipse sibi tradit spectator; non tamen intus digna geri promes in scaenam multaque tolles ex oculis, quae mox narret facundia praesens. Ne pueros coram populo Medea trucidet, aut humana palam coquat exta nefarius Atreus, aut in auem Procne uertatur, Cadmus in anguem. Quodcumque ostendis mihi sic, incredulus odi*), *De arte poetica*, 179-188, ed. & transl. Henry Rushton Fairclough, *Horace, Satires, Epistles and Ars poetica*. Cambridge, Mass.; London: Harvard University Press, 1978.

[68] On Saint Thomas Aquinas' ideas about images, see e.g. Herbert Fendrich, "Die Christen und die Bilder", in: Géza Jaszai (ed.), *Imagination des Unsichtbaren: 1200 Jahre Bildende Kunst im Bistum Münster: Ausstellung des Westfälischen Landesmuseums für Kunst und Kulturgeschichte, Landschaftsverband Westfalen Lippe Münster, 13. Juni bis 31. Oktober 1993*, Munster: Landschaftsverband Westfalen-Lippe Westfälisches Landesmuseum, 1993, 110-121.

[69] The Virgin is holding the Creator in her arms as an infant. Who is there who would not marvel, more from the sight of it than from the report, at the magnitude of the mystery, and would not rise up to laud the ineffable condescension that surpasses all words? For even if the one introduces the other, yet the comprehension that comes about through sight is shown in very fact to be far superior to the learning that penetrates through the ears. Has a man lent his ear to a story? Has his intelligence visualized and drawn to itself what he has heard? Then, after judging it with sober attention, he deposits it in his memory. No less-indeed much greater-is the power of sight. For surely, having somehow through the outpouring and effluence of the optical rays touched and encompassed the object, it too sends the essence of the thing seen on to the mind, letting it be conveyed from there to the memory for the concentration of unfailing knowledge. Has the mind seen? Has it grasped? Has it visualized? Then it has effortlessly transmitted the forms to the memory (Ἡ παρθένος τὸν κτίστην χερσὶν ὡς βρέφος βαστάζει. Τίς καθορῶν ἢ τοῖς ὠσὶ ταῦτα βαλλόμενος οὐ μᾶλλον καταπλαγείη τοῦ μυστηρίου τὸ μέγεθος καὶ πρὸς ὕμνον διανασταίη τῆς ἀφάτου καὶ λόγους πάντας νικώσης συγκαταβάσεως ; εἰ γὰρ καὶ δι' ἀλλήλων ἑκάτερον συνεισάγεται, ἀλλὰ πολὺ προέχειν ἐπὶ τῶν ἔργων αὐτῶν ἐπιδείκνυται τῆς κατὰ τὴν ἀκοὴν εἰσδυομένης μαθήσεως ἡ διὰ τῆς ὄψεως ἐγγινομένη κατάληψις. Ἔκλινέ τις τὸ οὖς εἰς διήγημα ; εἵλκυσε φανταζομένη τὸ ἀκουσθὲν ἡ διάνοια ; νηφούσῃ μελέτῃ τὸ κριθὲν τῇ μνήμῃ ἐναπέθετο. Οὐδὲν τούτων ἔλαττον, εἰ μὴ καὶ πολὺ μᾶλλον, κρατεῖ τὰ τῆς ὄψεως· καὶ γὰρ καὶ αὐτή γε δήπου τῇ προχύσει καὶ ἀπορροῇ τῶν ὀπτικῶν ἀκτίνων τὸ ὁρατὸν οἱονεί πως ἐπαφωμένη καὶ περιέπουσα τὸ εἶδος τοῦ ὁραθέντος τῷ ἡγεμονικῷ παραπέμπεται, ἐκεῖθεν διαπορθμευθῆναι δισοῦσα τῇ μνήμῃ πρὸς ἐπιστήμης ἀπλανεστάτης συνάθροισιν. Εἶδεν ὁ νοῦς, ἀντελάβετο, ἐφαντάσθη, τοὺς τύπους ἀκόπως ἐν τῇ μνήμῃ παρεπέμψατο), *Τοῦ αὐτοῦ ἁγιωτάτου Φωτίου πατριάρχου Κωνσταντινουπόλεως ὁμιλία, λεχθεῖσα ἐν τῷ ἄμβωνι τῆς μεγάλης ἐκκλησίας τῷ μεγάλῳ Σαββάτῳ ἐπὶ παρουσίᾳ τῶν φιλοχρίστων βασιλέων, ὅτε τῆς Θεοτόκου ἐξεικονίσθη καὶ ἀνεκαλύφθη μορφή*, sermon XVII, II,305, 10-II,306, 4, transl. by Cyril Mango, *The Homilies of Photius, Patriarch of Constantinople*. Washington, D.C.: Harvard University Press, 1958, p. 286-296 (for this passage, see p.

294). On *ekphrasis* and the visual perception of works of art, see e.g. Robert S. Nelson, "To Say and to See. Ekphrasis and Vision in Byzantium", in: Robert S. Nelson (ed.), *Visuality before and beyond the Renaissance: seeing as others saw*, Cambridge: Cambridge University Press, 2000, 143-168, in particular, p. 146-154 for this work of art and the description given by Photios in his homily.

[70] On the convention in Byzantine descriptions of works of art, see Henry Maguire, "*Truth and Convention in Byzantine Descriptions of Works of Art*". *Dumbarton Oaks Papers* 28 (1974): 113-140.

[71] Photios, following in the footsteps of Theodore the Studite († 826) and Patriarch Nicephorus († 828), is considered by many to have embraced the idea of the superiority of images. However, even if he did show a genuine interest in images, he was not the fervent supporter of them that has been claimed. Moreover, not everyone agrees on the real significance of what he said on the subject. Jean Gouillard and Hans-Georg Beck, for example, think that this is a case of "rhetorical overkill", of an "exuberant" and "emphatic" theology (Jean Gouillard, "*Contemplation et imagerie sacrée dans le christianisme byzantin*". *Annuaire de la Ve section de l' École pratique des Hautes Études. Résumés des conférences et des travaux* 86 (1977-1978): 29-50 and Hans-Georg Beck, *Von der Fragwürdigkeit der Ikone*. München: 1975). On Photios' ideas, see also Jean-Marie Sansterre, "La parole, le texte et l'image selon les auteurs byzantins des époques iconoclaste et posticonoclaste", in: *Testo e immagine nell'alto medioevo (Settimane di studio del Centro italiano di studi sull'alto medioevo XLI)*, Spoleto: 1994, 197-243, p. 230-232).

[72] *Colligere est ea de quibus prolixius vel scriptum vel disputatum est ad brevem quandam et compendiosam summam redigere, quae a maioribus epilogus, id est, brevis recapitulatio supradictorum appellata est*, *Didascalicon*, III, 11, ed. Thilo Offergeld, *Hugo von Sankt Viktor, Didascalicon de studio legendi Studienbuch*. Freiburg; Basel; Wien: Herder, 1997.

[73] On this feature, see Stavros Lazaris, "Learning and memorising hippiatric knowledge in the late Antiquity and in Byzantium", in: Bernard Andenmatten, Agostino Paravicini Bagliani and Eva Pibiri (ed.), *Le cheval dans la culture médiévale*, Lausanne: 2015, 269-294, p. 281-288.

an auxiliary research instrument[74]. Therefore, these miniatures can also be designated as heuristic. Of course, the images in this text may also facilitate access to knowledge, but only for those who beforehand acquired precise knowledge on the subject. Indeed, the pictures in the Apollonius text were aimed at people who knew the diseases, either from reading the text or from the theoretical and practical explanations of a master. The young disciple, even before he could refer thereto, needs to identify and to understand the iconography. To succeed, he must rely either directly on the text to which the picture refers, or indirectly on his teacher's explanations. Without these, it is difficult to understand by a single image the use of a given instrument, for example. The difficulty of understanding is even greater since this iconography is uncommon and hence very little-known.[75] Once clarification is acquired and the image is identified and understood, the role of these miniatures in easing understanding the text ceases. Contrary to common belief, these images have, in fact, no illustrative function for the text to which they are associated but serve for memorizing and recalling the written word.[76]

These mnemonic features can be greatly reinforced thanks to the frames. In fact, in addition to the miniatures alone, a framed image like the one in the Nicetas codex can reinforce memorization in the same way as the ancient memorization system based on the mental placement of images in architectural locations.[77] Indeed, unlike the artificial images in the Apollonius of Citium text, which have a direct relationship with the text and a didactic purpose for the reader (the images are part of the work), the frames are not part of the work but could serve as a kind of metaphoric development of artificial images, i.e., a symbolic reference to the idea of passage through a physical house, more precisely from one room to another. In other words, they can be used as a *locus memoriae* to reinforce the mnemonic impact of the images. Indeed, each image is inserted into an architectural scene which could help the reader to create a mental *locus*, a typical mnemonic container to store data.[78]

The "method of *loci*" is a general designation for mnemonic techniques that rely upon memorized spatial relationships to establish, order and recollect memorized content. John O'Keefe and Lynn Nadel[79] refer to the method of *loci*, an imaginal technique known to the ancient Greeks and Romans and described by Frances Amelia Yates[80] as well as by Alexander Romanovich Luria.[81] In this technique the subject memorizes the layout of some building. When desiring to remember a set of items the subject "walks" through these *loci* and commits an item to each one by forming an image between the item and any distinguishing feature of that *locus*. Retrieval of items is achieved by "walking" through the *loci*, allowing the latter to "activate" the desired items.[82]

The classical rules and examples related to the *Ars Memoriae* flourished throughout the Middle Ages and underwent profound reformulations. Medieval illuminated manuscripts, for example, used all sorts of devices to create memory spaces, including, as we outlined above, artificial images but also frames. In fact, the role of frames in memorization cannot be

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[74] It should not be forgotten that, in most Medieval manuscripts, this function is strengthened by the quasi-absence of folio's (or page's) numbering, as well as, in several cases, of alphabetical tables, of index and of tables of contents (the alphabetical order was not unknown but, when classifying subjects, the analogical order was employed more often, which did not make research any easier). It was to help our often faulty memory that Columella added to his agronomical treatise (*De re rustica*, XI, 3, 65, ed. E. S. Forster and Edward H. Heffner, *Lucius Junius Moderatus Columella, On agriculture*. Cambridge (Mass.); London: Harvard university press; W. Heinemann, 1968) such a kind of table of contents (*omnium librorum meorum argumenta subieci*), accompanied by summaries, which allow to find easily "what should be sought in every book and how each work must be carried out" (*quid in quoque quaerendum, et qualiter quidque faciendum sit*). This gap can be filled among others via image.

[75] See Zoltan Kádár, "Le problème du style dans les illustrations du manuscrit de la Bibliothèque nationale de Paris (Gr. 2244)", in: M. Berza and E. Stanescu (ed.), *Actes du XIVe congrès international des études byzantines, (Bucarest, 6-12 sept. 1971)*, Bucuresti: Academia Republicii Socialiste Rômânia, 1975, 459-461.

[76] Obviously, the role of the miniature of other texts can be different.

[77] On ancient mnemotechny, see L. Volkmann, "*Ars memorativa*". *Jahrbuch der kunsthistorischen Sammlungen in Wien* N.S. 3 (1929): 111-200; Helga Hajdu, *Das mnemotechnische Schrifttum des Mittelalters*. Wien: F. Leo & Comp., 1936; Frances Amelia Yates, *The art of memory*. London: Routledge and Kegan Paul, 1966; Herwig Blum, *Die Antike Mnemotechnik*. Hildesheim; New York: G. Olms, 1969; Mary J. Carruthers, *Machina memorialis: méditation, rhétorique et fabrication des images au Moyen âge*. [Paris]: Gallimard, 2002; Mary J. Carruthers, *The craft of thought: meditation, rhetoric, and the making of images, 400-1200*. Cambridge: Cambridge University Press, 2008; Elizabeth-Anne Scarth, *Mnemotechnics and Virgil: The Art of Memory and Remembering*. Saarbrücken: Verlag Dr. Müller, 2008; Lazaris, *Art et science vétérinaire à Byzance*, 98-103 (and p. 104-106 for the modern experiments); Lina Bolzoni and

Jeremy Ira Parzen, *The Gallery of Memory: Literary and Iconographic Models in the Age of the Printing Press*. Toronto: University of Toronto Press, 2017. On an oculometric (eye-tracking) experience on Byzantine manuscripts, see Stavros Lazaris, "*Le Sofija, Naučen Centăr za Slavjano-Vizantijski Proučvanija Ivan Dujčev, D. gr. 297 (olim Kosinitza 244) et ses figures*". *Βυζαντινά Σύμμεικτα [= Τόμος προς τιμήν του Καθηγητή Ταξιάρχη Κόλια]* ([in print]).

[78] On the metaphors of memory see e.g. Harald Weinrich, Paola Barbon, Italo Michele. Battafarano, *et al.*, *Metafora e menzogna: la serenità dell'arte*. Bologna: Il Mulino, 1976, p. 49-53; Mary J. Carruthers, *The Book of memory: A study of memory in Medieval Culture*. Cambridge; New York, N.Y.; Melbourne: Cambridge university press, 1992, 16-45; Douwe Draaisma, *Metaphors of memory: a history of ideas about the mind*. Cambridge, U.K.; New York: Cambridge University Press, 2000; Andrea Torre, "Patterns and Functions of the Mnemonic Image in the Sixteenth and Seventeenth Centuries", in: Donald Beecher and Grant Williams (ed.), *Ars reminiscendi. Mind and memory in Renaissance culture*, Toronto: Centre for Reformation and Renaissance Studies, 2009, 45-67.

[79] John O'Keefe and Lynn Nadel, *The Hippocampus as a cognitive map*. Oxford: Clarendon press, 1978, p. 389-390.

[80] Yates, *The art of memory*.

[81] Alexander Romanovich Luria, *Une Prodigieuse mémoire: étude psychobiographique*. Paris: Delachaux et Niestlé, 1970.

[82] The efficacy of this technique has been well established (see e.g. John Ross and Kerry A. Lawrence, "*Some observations on memory artifice*". *Psychonomic Science* 13, 2 (1968): 107-108; Herbert F. Crovitz, "*Memory loci in artificial memory*". Ibid.16, 2 (1969): 82-83; Gary G. Briggs, Stephen Hawkins and Herbert F. Crovitz, "*Bizarre images in artificial memory*". Ibid.19, 6 (1970): 353-354; Herbert F. Crovitz, "*The capacity of memory loci in artificial memory*". Ibid.24, 4 (1971): 187-188; Glen Lea, "*Chronometric analysis of the method of loci*". *Journal of Experimental Psychology: Human Perception and Performance* 1, 2 (1975): 95-104).

overstated. Furthermore, the fact that neither the columns nor the number of steps is the same from one figure to the next is probably not a fault of the miniaturists. In fact, as we read in a mnemonic manual (*Di l'artificial memoria*) kept in Paris, Bibliothèque Sainte-Geneviève, Ms. 3368: "And in fact the ancients, when they wanted to fix and retain something, they used different colours and figures in their books so that such diversity and difference would improve their retention."[83] Most likely, these frames were made for the Nicetas codex (see *supra*), and this addition certainly enhanced the mnemonic qualities of these images, which from then on become an even more valuable aid for doctors who consulted the codex.[84] Therefore, we can conclude that the miniatures framed in Apollonius' treatise were a powerful mnemonic device.

5. Conclusion

The aim of this paper was to identify the raison d'être of the frames in the Nicetas codex manuscript. There were several reasons why the frames of columns and arches were used in medieval manuscripts. The original Eusebian gospel tables of earlier centuries used them, e.g. to enshrine the tables in a monumental framework, to express a sense of honour and dignity, to confer solemnity to the canon tables, and to serve as a gateway to the Gospels. The columns and arches, also used in illustrations to frame portraits of important people to honour them or bestow some dignity to these individuals. The Nicetas codex frames have a similar style as the Etchmiadzin and Garima table frames. Thus, in the 29 medical illustrations of joint treatments in the Nicetas codex, we can assume that the columns and arches were used in particular as a mnemonic visual device to help doctors memorize the illustrations of Apollonius of Citium. The frames were likely added during the period of the Macedonian Renaissance when the depiction of architectural frames for splendid classical architecture was revived. When the Nicetas codex reached Italy in the 15th century, this style of using classical architecture appeared to diminish, and the columns and arches were discarded when copies of the Nicetas illustrations were produced.

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[83] "[...] Et de fait les anciens quand ils voloient aulcune chose impectorer et recorder ilz metoient en leurs livres diverses couleurs et diverses figures ad fin que la diversité et la difference leur donnast meilleure souvenance" (*Notables enseignemens pour avoir memoire et souvenance des choses veues*, fol. 96 - https://portail.biblissima.fr/ark:/43093/mdata626445802b0df892f31cf45abaa062edfb45552c). On this passage and the manuscript, see e.g. Jean-Philippe Antoine, "*Ancora sulle virtù: la nuova iconografia e le immagini di memoria*". *Prospettiva* 30 (1982): 13–29, p. 25-26; Torre, "Patterns and Functions of the Mnemonic Image", 45-67. For a further bibliography, see: https://calames.abes.fr/pub/#details?id=BSGC11681.

[84] On this point, see also Lazaris, "*Rôles et natures de l'image scientifique à Byzance*", 53-56.

Galenus, *Galeni Septima classis, artem morborum curatricem describit: promptaque ad id opus remedia quem plurima subjungit, necnon quae ad deligationes, luxationes, & fracturas attinet, chirurgiam...* Venetiis: apud haeredes Lucaeantonii Juntaeapud haeredes Lucaeantonii Juntae, 1541

Galenus, *Galeni septima Classis curandi Methodum tum diffuse tum breviter descriptam, Victus Rationem in Morbis acutis, singulorum Morborum facile paranda Remedia, privatam quorundarum Morborum Curationem, Chrirurgiae Constitutionem, Fracturarum ac Luxationum Sanationem, Fasciarum denique & Laqueorum & Machinamentorum Tractatum continet*. Venetiis: apud Juntas, 1550

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